SCH4U: Chemical Systems & Equilibrium – Unit Plan

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| 7.1 Dynamic Equilibrium in Chemical Systems **Minds-On Activity: Magic Flask** | 7.2 Equilibrium Law in Chemical Reactions  **Activity #1: Gizmo – Equilibrium and Concentration** | 7.3 Qualitative Changes in Equilibrium Systems | 7.3 **Lab: Testing Le Chatelier’s Principle** | 7.5 Quantitative changes in equilibrium systems |
| 7.5 Quantitative changes in equilibrium systems  **Quiz Review: Jeopardy** | Quiz #1  7.6 the solubility product constant | 7.6 the solubility product constant | 7.7 energy and equilibrium: the laws of thermodynamics | 7.7 energy and equilibrium: the laws of thermodynamics |
| 8.1 The nature of acid-base equilibria | 8.1 The nature of acid-base equilibria  **In-class case study assignment (STSE)** | 8.1 Lab: Determining the pH of common substance | 8.2 weak acids and bases | 8.2 weak acids and bases |
| 8.3 acid-base properties of salt solutions  Quiz Review | Quiz #2  8.3 acid-base properties of salt solutions | 8.4 acid-base titration | 8.4 acid-base titration  **In-class case study assignment (STSE)** | 8.5 buffers |
| Test Review | Unit Test |  |  |  |

Rationale: In creating the unit plan, we roughly followed the outline provided in the Chemistry 12 textbook published by Nelson. The theoretical lessons were evenly divided, with eight pertaining to chapter 7: Chemical Systems and Equilibrium, and another eight dedicated to chapter 8: Acid-Base Equilibrium. Extra time was dedicated to what we considered to be essential topics, namely from chapter 7, quantitative changes in equilibrium systems, the solubility product constant, energy and equilibrium: the laws of thermodynamics and from chapter 8, the nature of acid-base equilibria, weak acids and bases, acid-base properties of salt solutions, and acid-base titration. This was especially important for the material in chapter 8, as this is when we penciled in time for in class work on the STSE assignment. One class was dedicated solely to laboratory work, testing Le Chatelier’s Principle. We anticipated administering two quizzes just past the midway point of each chapter, and a comprehensive test at the end of the unit. Relevant in class demos will be performed where appropriate.

Expectations:

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| 1. Dynamic Equilibrium in Chemical Systems | E2.1, E3.1, E3.2 |
| 1. Equilibrium Law and Chemical Reactions | E2.1, E3.1, E3.2 |
| 1. Qualitative Changes in Equilibrium Systems | E2.2, E3.3 |
| 1. Testing Le Chatelier’s principle | E2.2, E3.3 |
| 1. Quantitative Changes in Equilibrium Systems | E2.3, E2.4, E3.3, E3.4 |
| 1. Quantitative Changes in Equilibrium Systems | E2.3, E2.4, E3.3, E3.4 |
| 1. Solubility Product Constant | E2.4, E3.4 |
| 1. Solubility Product Constant | E2.4, E3.4 |
| 1. Energy and Equilibrium: The Laws of Thermodynamics | D2.2 |
| 1. Energy and Equilibrium: The Laws of Thermodynamics | D2.2 |
| 1. Nature of Acid-Base Equilibria | E2.4, E3.4, E3.5, E3.6 |
| 1. Nature of Acid-Base Equilibria | E1.2, E2.4, E3.4, E3.5, E3.6 |
| 1. Determining the pH of a common substance | E2.5 |
| 1. Weak Acids and Bases | E2.3, E3.4, E3.7 |
| 1. Weak Acids and Bases | E2.3, E3.4, E3.7 |
| 1. Acid-Base Properties of Salt Solutions | E2.4, E2.5 |
| 1. Acid-Base Properties of Salt Solutions | E2.4, E2.5 |
| 1. Acid-Base Titration | E3.4, E3.5 |
| 1. Acid-Base Titration | E1.2, E3.4, E3.5 |
| 1. Buffers | E3.8 |